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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,907	08/31/2001	Tsuneo Ikura	740819-640	8137

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EXAMINER

THOMAS, TONIAE M

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 07/09/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,907

Applicant(s)

IKURA, TSUNEO

Examiner

Toniae M. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2 and 4-9 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. This action is an official response to the amendment filed on 05 April 2003. The amendment cancelled claim 1, and added claims 7-9. Currently, claims 2-9 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. *Claims 2, 7, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (US 429,116 B1).*¹

Wang et al. disclose a method for fabricating a semiconductor device (figs. 1-11 and accompanying text). The method comprises the following steps: forming a first insulating film 24 with a relatively low dielectric constant and low mechanical strength on a substrate (fig. 2); partially retaining the first insulating film in a first region through selective etching using a first mask pattern 28 formed on the first insulating film (fig. 4);

¹ Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

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forming a second insulating film 30 with a relatively high dielectric constant and high mechanical strength, such that the second insulating film covers the retained first insulating film (fig. 5); forming a thinned portion of the second insulating film on the retained first insulating film by planarizing the second insulating film using CMP (col. 8, lines 51-53); forming a first interconnect groove 36 in the thinned portion of the second insulating film and the retained first insulating film through selective etching the thinned portion of the second insulating film and the retained first insulating film using a second mask pattern 34 formed on the thinned portion of the second insulating film (fig. 8); and forming a buried interconnect 42 in the first interconnect groove, whereby the thinned portion of the second insulating film and the retained first insulating film are provided on the sides of the buried interconnect (fig. 11).

A third insulating film for preventing diffusion of a metal included in the buried interconnect 42 is formed (col. 9, lines 62-64).

The thickness of the thinned portion of the second insulating film in the first region overlying the retained first insulating film is smaller than the thickness of the second insulating film in a second region (fig. 10).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. *Claims 4, 5, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al.*

While Wang et al. disclose forming the first insulating film 24, such that it includes an organic material as a principal constituent (col. 7, lines 10-20), and forming the second insulating film 30, such that includes an inorganic material as a principal constituent (col. 8, lines 25-34), as recited in claim 4, Wang et al. do not teach the step of forming a second interconnect groove in a second region of the second insulating film through selective etching using the second mask pattern, as recited in claims 4, 5, and 9. However, Wang et al. teach that it is conventional to form multiple interconnects in an integrated circuit (col. 1, lines 29-60). Since it is conventional to form multiple interconnects in an integrated circuit and Wang et al. disclose a method for forming an improved interconnect in an integrated circuit (col. 1, lines 13-17), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wang et al. by forming a second interconnect groove in a second region of the second insulating film through selective etching. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a second interconnect groove using the second mask pattern, because using the same mask pattern to form first and second grooves in the second insulating film reduces the number of masking steps.

4. *Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al.*

Wang et al. does not teach that the thinned portion of the second insulating film has a thickness of 10 nm to 50 nm. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the second insulating film such that the thinned portion of the second insulating film has a thickness of 10 nm to 50 nm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Allowable Subject Matter

5. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (703) 305-7646. The examiner can normally be reached on Monday through Thursday, and alternating Fridays, from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JMJ

June 25, 2003


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800